

JAN MCLIN CLAYBERG

PATENT AND TECHNICAL TRANSLATION

JAN MCLIN CLAYBERG *
OLAF BEXHOEFT **

CERTIFIED BY AMERICAN TRANSLATORS ASSOCIATION
* GERMAN AND FRENCH TO ENGLISH
** ENGLISH TO GERMAN

5316 LITTLE FALLS ROAD
ARLINGTON, VIRGINIA 22207
TELEPHONE (703) 533-0333
FACSIMILE (703) 533-0334
JANCLAYBERG@YAHOO.COM

April 21, 2006

DECLARATION

The undersigned, Olaf Bexhoeft, hereby states that he is well acquainted with both the English and German languages and that the attached is a true translation to the best of his knowledge and ability of the German text of PCT/EP2004/005860, filed 05/29/2004, and published on 09/09/2005 as WO 2005/083856 A1, and of twenty-three (23) amended claims and twice amended claim 1.

The undersigned further declares that the above statement is true; and further, that this statement was made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under Section 1001 of Title 18 of the United States Code and that such willful false statements may jeopardize the validity of the application or document or any patent resulting therefrom.



Olaf Bexhoeft
5316 Little Falls Rd.
Arlington, VA 22207-1522

Express Mail No.: EV18568177945

Mailed: 19 JUL 2006

WO 2005/083856
PCT/EP2004/005860

-V0-760
10/586574
IAP6 Rec'd PCT/PTO 19 JUL 2006

Kit for Producing a Frame Superstructure for Switchgear Cabinets

The invention relates to a kit for producing frame structures for switchgear cabinets.

Racks for switchgear cabinets are known in various structural sizes in regard to width, depth and height. It is possible there to connect the horizontal and vertical profiled sections in the form of frame legs in various ways with each other. Thus, twelve profiled sections can be connected with each other in the four corner areas of the rack by means of corner connectors, to which respectively three frame legs, which meet each other, are attached.

However, the rack can also be designed in such a way that the respective four horizontal frame legs in the bottom area and the top area of the rack form a bottom and top frame, which are fixedly connected with each other. The four vertical frame legs connect the two frames in the four corner areas.

Moreover, it is possible to use different profiled sections of different cross sections and profile sides for the rack, which support one or several rows of fastening receivers. In this case the rows have different divisions of identically or differently designed fastening receivers.

It is possible to see from this alone, that the installation requirements made on a track greatly affect the frame structure.

It therefore is the object of the invention to produce a kit from a few simple components, with which frame structures can be achieved which can be matched to different

WO 2005/083856
PCT/EP2004/005860

installation requirements.

To attain this object a kit is created, which consists of

a) a cabinet rack made of four horizontal broad struts, four horizontal depth struts, as well as four vertical frame legs of a preset width, depth and height,

b) vertical frames made of two horizontal broad frame struts and two vertical profiled frame elements, which can be installed in a cabinet rack and connected with its depth struts, and

c) cover elements which, as bottom element and top element, can be connected with two spaced-apart vertical frames to form an independent basic rack.

The cabinet rack alone can be used in a known manner for the installation of different built-in devices, and can be closed off by means of a cabinet door and panel elements.

But it is also possible to install two vertical frames in this cabinet rack, which are used, for example, for installing 19" built-ins of different installation depth.

Finally, two such vertical frames with two cover elements can be connected to form an independent basic rack, in which such built-ins can be installed, wherein a simple adaptation to different installation depths of these built-ins is possible. This independent basic rack can be combined by means of a cabinet door and vertical lateral panel elements into a basic rack which can be matched to quite different installation requirements and can be completed to form an entirely independent switchgear cabinet. It is possible in this way by means of two additional simple components to considerably increase the variation options for producing frame structures, and in this way to considerably

WO 2005/083856
PCT/EP2004/005860

reduce the storage of switchgear cabinets for varied installation conditions.

In this case the cabinet rack as a component of the kit can be designed in such a way that the broad struts, the depth struts and the frame legs of the cabinet rack are formed as sections of respectively identical profiled elements, which are fixedly connected with each other, for example welded together, in the corner areas of the cabinet rack by means of corner connectors. However, the design can also be selected such that the broad struts and the depth struts of the cabinet rack form a solid bottom frame and a solid cover frame and that the vertical frame legs are attached in the corner areas of the bottom frame and the top frame and form, together with the corner connectors and the bottom and top frames, a continuous exterior receiver.

In accordance with one embodiment it is provided for the structural units of the kit designed as vertical frame, that the vertical profiled frame elements of the vertical frames have a profiled base side with at least one row of fastening receivers, which terminate with the front faces of the horizontal broad vertical struts, and that lateral legs are beveled off on both sides of the profiled base side, which are oriented to the longitudinal sides of the associated horizontal broad frame struts of the vertical frames and are connected with them. In this case the vertical profiled frame elements of the vertical frame can be designed in such a way that at least one row of identical fastening receivers is cut in a uniform aligned graduation into the profiled base side and the beveled lateral legs of the vertical profiled frame elements of the vertical frames, or that at least one row of equal or identical fastening

WO 2005/083856
PCT/EP2004/005860

receivers is cut in the same or different graduation into respectively the profiled base side and in the beveled lateral legs of the vertical profiled frame elements of the vertical frames.

The structural unit of the vertical frames has sufficient sturdiness and torsional rigidity, and therefore a permanent alignment of the parts of the vertical frame, if it is provided that the horizontal broad frame struts and the vertical profiled frame elements of the vertical frames are fixedly connected with each other in the corner areas, for example welded together.

So that two vertical frames together with two cover elements can be connected in a simple manner into a basic rack, an embodiment provides that on two facing sides the plate-shaped cover elements have fastening edges, which are beveled at right angles and have at least one row of fastening receivers, and that the vertical profiled frame elements of two vertical frames can be connected by means of their profiled base sides with the insides of the fastening edges of the cover elements at different spacings to form a basic rack.

An installation of the vertical frames into a structural unit formed as a cabinet rack is made easier in that the horizontal broad frame struts of the vertical frames are provided with cable guide openings, and that the two vertical frames can be connected via fastening receivers of the horizontal broad frame struts with the facing tops of the horizontal depth struts of the cabinet rack at different distances from each other.

If the vertical frames are parts of a basic rack it is provided for the introduction of cables via the bottom

WO 2005/083856
PCT/EP2004/005860

element or the top element that the base plates of the cover elements are provided with cable introduction recesses in the basic rack above the horizontal broad frame struts of the vertical frames.

A design is of advantage for attaching lateral walls and a cabinet door to the basic rack which is distinguished in that the fastening edges of the cover elements have connecting strips beveled toward the exterior on their free edges, and protrude past the base plate of the cover elements over the fastening edges and together with the connecting strips form receivers for attaching lateral walls on the basic rack, as well as that the base plates of the cover elements protrude at the sides extending perpendicularly in respect to the fastening edges and have bevels, on which a cabinet door can be hinged and locked, and a rear wall can be fastened.

The construction of the cabinet rack can be simplified in that the base plates of the cover elements are provided with a center opening and with fastening bores in the corner areas. In this case the attachment of the vertical frame legs at the bottom frame and the top frame has been solved in that the vertical frame legs of the cabinet rack have a profiled element with a plug-in connection for the plug-in element of the corner connectors, wherein, together with the exterior contour, the profiled element constitutes the exterior receptacle, which is designed to be symmetrical in respect to the diagonal plane of the bottom and top frames, and by means of this the exterior receptacle in the corner areas of the cabinet rack can be maintained over the entire height of the cabinet rack, that the bottom and the top frames of the cabinet rack have corner receivers, into which

WO 2005/083856
PCT/EP2004/005860

the corner connectors can be placed with a filler element and connected with the bottom or top frame wherein, with their exterior contour, the filler elements of the corner connectors extend the exterior receptacles of the vertical profiled frames of the cabinet rack past the bottom and top frames.

In case of an asymmetric cross section with interchanged front sides, the vertical frame legs can be supportingly fastened at the bottom frame or the top frame if it has been provided that the front sides of the vertical profiled frame elements of the cabinet rack are connected in an upright manner with the facing sides of the bottom and of the top frames and the filler elements of the corner connectors.

The vertical frame legs of the cabinet rack can be utilized for bringing in connection and junction cables in that the vertical profiled frame elements of the cabinet rack form a channel, open to the interior of the cabinet rack, between the bottom and the top frames, which can be closed by means of a profiled box, and that this profiled box has vertical channels and is provided with rows of bores in the cover wall. In this case the profiled box can close off channels of the vertical frame legs of the cabinet rack which are not used. Closing the channel becomes optimal in that the cover wall of the profiled box covers the channel in the vertical profiled frame elements of the cabinet rack with covering strips.

Further fastening possibilities at the vertical frame legs of the cabinet rack are provided in that the profiled side of the vertical profiled frame section forming the channel supports connecting strips formed on the exterior of

WO 2005/083856
PCT/EP2004/005860

the free profiled side.

It can be provided in accordance with a preferred embodiment of the invention that the cabinet door is provided with a beveled edge, which receives hinge elements with hinge bolts, which can be inserted into bearing receivers of the cover elements of the basic rack, in the corner areas of the hinge side of the cabinet door, and that the hinge bolts are adjustable in an axially limited manner in the hinge elements and can be fixed on the bevel of the cover elements so they do not shift, at least in the position in which they are engaged with the facing bearing receiver or bearing bushing.

In this case the hinge elements which can be attached to the rack for hinging the cabinet door become superfluous, since their job is taken over by the bearing receivers at the bevels of the cover elements of the rack. Only the counter-hinges with the hinge bolts to be attached to the cabinet door are required. The hinge elements permit easy mounting/removal of the cabinet door at the rack.

The rack makes the hinging of the cabinet door easier in that the end edges of the fastening edges of the cover elements are set back in relation to the beveled edges at a minimum by an amount which at least corresponds to the dimensions of the first door bevel directed perpendicularly to the door leaf. A sort of receptacle is created in this way at the rack, which can receive the cabinet door pivotably.

The rotary seating of the hinge bolts fixed in the hinge elements can be improved in a simple way in that bearing bushes are inserted into the bearing receivers in the beveled edges of the cover elements.

If bearing receivers or bearing bushes are provided in

WO 2005/083856
PCT/EP2004/005860

the two end areas of the beveled edges of the cover elements, it can be additionally provided that the lock side of the cabinet door has displaceable locking bars, which can be shifted manually or by means of a rod closing device and can be inserted into the bearing receivers or bearing bushes of the beveled edges of the cover elements of the rack, or can be moved out of them.

A conceivable alternative of the invention provides that the bearing receivers are designed as bearing bushes, which are arranged on facing fold areas of the double-walled edges. A stable connecting point for the door hinges has been created in this way. Moreover, at the front the fold forms a rounded end of the cover element, which is visually attractive and prevents the danger of a cutting injury. In this connection it can be provided in particular that the bearing receivers are designed as bearing bushes, which are arranged on facing fold areas of the double-walled edges. The functionality of the double-walled edge can be additionally extended if it is provided that at least one of the double-walled edges has a bevel, which protrudes as a door stop in the direction toward the respectively oppositely located cover element.

The invention will be explained in greater detail by means of an exemplary embodiment represented in the drawings. Shown are in:

Fig. 1, a vertical frame as the first component of the kit in a perspective plan view,

Fig. 2, a perspective partial plan view of a corner area of the vertical frame in Fig. 1,

Fig. 3, in an enlarged perspective plan view a cover element used as a bottom element as the second component of

WO 2005/083856
PCT/EP2004/005860

the kit.

Fig. 4, in an exploded view the corner area of a bottom frame with a corner connector and a vertical frame leg of a cabinet rack as the third component of the kit,

Fig. 5, a partial perspective view of the vertical frame leg with a channel, which can be closed by means of a profiled box,

Fig. 6, in a perspective view the lower portion of the cabinet rack with two installed vertical frames in accordance with Fig. 1, and

Fig. 7, in a perspective plan view a basic rack composed of two vertical frames in accordance with Fig. 1 and two cover elements in accordance with Fig. 3,

Fig. 7b, an alternative design detail of the cover element,

Fig. 8, a basic rack with lateral walls and a hinged-on cabinet door,

Fig. 9, a perspective detailed view with the lower corner area of the rack and switchgear cabinet with the hinged-on cabinet door, and

Fig. 10, a sketch of the partial view in accordance with Fig. 9 without cabinet door.

The vertical frame 10 in accordance with Fig. 1 constitutes the first component of the kit. It consists of two vertical profiled frame elements 11 and two horizontal broad frame struts 12. In this case the two profiled frame elements 11 with the facing profiled sides 11.1 (Fig. 2) with rows of fastening receivers 11.2 form a fastening level, for example for 19" installations. In the area of their front sides, the profiled frame elements 11 are fixedly connected with the ends of the broad frame struts 12, for example

WO 2005/083856
PCT/EP2004/005860

welded. The profiled sides 11.1 of the profiled frame elements extend parallel in relation to a longitudinal edge of the broad frame struts 12, while the profiled sides 11.3 terminate at the front ends of the broad frame struts 12. Finally, the profiled sides 11.6 terminate at the other longitudinal edges of the broad frame struts 12. The profiled sides 11.3 and 11.6 are provided with at least one row of fastening receivers 11.4 and 11.7. So that the two vertical profiled frame elements 11 can be identically designed in spite of their asymmetric cross section and used for the vertical frame 10, they have been attached with interchanged front faces to the broad frame struts 12.

The broad frame struts 12 can be provided with cable introduction openings 12.2 and can be reinforced at the longitudinal edges with beveled edges 12.1. Moreover, the broad frame struts 12 can be provided with fastening receivers 12.3 in the area of their front sides, such as can be seen in the partial perspective view in accordance with Fig. 2.

A cover element 20 is represented in an enlarged perspective view in Fig. 3, which is designed to be symmetrical in relation to the central longitudinal plane, which extends parallel with the beveled fastening edges 23, so that the cover element 20 can be used as a bottom element, as well as a top element for a basic rack 60 in accordance with Fig. 7. In this case the fastening edges 23 are oriented toward each other. The fastening edges 23 support two rows of fastening receivers 23.1 and 23.2. The distance between the insides of the two fastening edges 23 of a cover element 20 corresponds to the exterior dimension of the profiled sides 11.3 of the two profiled frame elements 11 of

WO 2005/083856
PCT/EP2004/005860

a vertical frame 10, so that the vertical frame 10 can be connected via these profiled sides 11.3 with fastening receivers 11.4 with the insides of the fastening edges 23 of the cover elements 20. In this case a lower cover element 20 as the bottom element, and an upper cover element 20 as the top element, connect two spaced-apart vertical frames 10 to form a basic rack 60 in accordance with Fig. 7. Here, the profiled sides 11.1 can be arranged on the sides facing away from each other of the vertical frames 10. This can be easily achieved by a rotation of the second vertical frame 10 by 180°.

The cover element 20 has a base plate 21, which is provided with cable introduction openings 21.1 which, with the basic rack 60 completed, overlap the cable introduction openings 12.1 of the broad frame struts 12 of the vertical frame 10. Furthermore, the base plate 21 of the cover element 20 can be provided with a center opening 21.1, and with fastening bores 22 in the corner areas.

These edge areas of the base plate 21 are provided with bevels 25, which protrude past the front faces of the fastening edges 23 and make the attachment of a rear wall and a cabinet door at the basic rack 60 easier. The base plate 21 of the cover element 20 also protrudes from the exteriors of the fastening edges 23 and forms a receptacle 24 with it, which makes the attachment of lateral walls on the basic rack 60 easier. In this case it is also possible to employ outwardly beveled connecting strips 26 at the free edges of the fastening edges 23. It is easy to comprehend that the cover element 20 can be produced in a simple manner and cost-effectively as a stamped-and-bent sheet metal element.

The construction of a further component of the kit will

WO 2005/083856
PCT/EP2004/005860

be explained by means of Figs. 4 to 6, namely a cabinet rack 30, which is laid out in accordance with a preset size in width, depth and height.

Here, this cabinet rack 30 is composed of identical bottom frames and top frames 35 with four vertical frame legs 33. These identical frames are each put together from two horizontal broad struts 31 and two horizontal depth struts 32. The struts which meet in the corner areas of the frames 35 are fixedly connected with each other and constitute corner receivers 35.1. The struts 31 and 32 have horizontal and vertical profiled sides with rows of fastening receivers 31.1 and 32.1, which preferably differ from the fastening receivers 11.2 of the vertical frames 10. Corner connectors 40 have been inserted into the corner receivers 35.1 of the frames 35 and are screwed together with the frame in such a way that a filler element 40.1 of the corner connector 40 fills the corner receiver 35.1 in such a way that the filler element 40.1 terminates flush with the horizontal profiled sides of the struts 31 and 32, so that the vertical frame leg 33 pushed on the plug-in element 40.2 can be supported on it.

As Fig. 4 shows, the plug-in element 40.2 is matched to the cross section of a hollow space 33.3 in the profiled element 33.1 of the vertical frame leg 33. With the outer contour, this profiled element 33.1 forms an outer receptacle 36 which is symmetrical in respect to the diagonal line of the corner receiver 35.1 which is continued over the filler element 40.1 of the corner connector 40 and makes the attachment of sheathing elements of the cabinet rack 30 easier.

As Figs. 4 and 5 show, a profiled element 33.4 follows the profiled element 33.1, which forms a channel 33.0 open

WO 2005/083856
PCT/EP2004/005860

toward the interior of the cabinet rack 30. This channel 33.0 can be used as a cable conduit. If it is not needed, it can be closed off by means of a profiled box 50 with cable conduits 50.1 and 50.2 and a closing wall 50.3. The closing wall 50.3 has rows of bores 50.4 and covers the channel 33.0 of the vertical frame leg 33 with covering strips 50.5.

As can be seen in Fig. 6, the vertical frame legs 33 are fastened with interchanged front sides 33.1 and 33.2 at the frame 35, so that at the cabinet rack 30 the profiled elements 33.4 terminate flush with the depth struts 32 and are facing each other. This is possible in a simple manner by an appropriate turning and exchange of the front sides 33.1 and 33.2 of the four vertical frame legs 33 and leads to the cabinet rack 30 indicated in Fig. 6, whose upper top area is simply constructed in the opposite way.

Two spaced-apart vertical frames 10 are fastened by means of the depth struts 32 of the lower and upper frame 35. In this case the vertical frames 10 with the profiled sides 11.1 and their fastening receivers 11.2 are arranged on sides of the vertical frame 10 facing away from each other and have been placed at a defined distance.

The cabinet rack 30 with two frames 35 and four vertical frame legs 33 installed in accordance with Fig. 6 can be laid out without or with built-in vertical frames. The vertical frames 10 are connected with the depth struts 32 of the frames 35 via the fastening receivers 12.3 of the broad frame struts 12. The height of the vertical frames 10 is determined by the interior distance between the two frames 35.

The basic cabinet rack 60 of the switchgear cabinet is shown in a perspective plan view in Fig. 7, which has been

WO 2005/083856
PCT/EP2004/005860

put together from two plate-shaped horizontal cover elements 20 and two vertical frames 10. In this case the vertical profiled frame elements 11 can have different profiled sides with rows of fastening receivers.

The vertical frames 10 are fastened at a distance from each other at beveled and facing fastening edges 23 of the cover elements 20, wherein the fastening edges 23 are provided with at least one row of fastening receivers 23.1, or elongated holes extending in the direction of the cabinet depth. In this case the vertical profiled frame elements 11 can be set back in respect to the edges 23.1 (see Fig. 10) of the fastening edges 23. The edges of the cover elements 20 extending perpendicularly in respect to the fastening edges 23 are beveled in an L-shape, so that edges 25, 27 are created, which are double-walled with the base plate 21 of the cover element 20. This edge can also be closed by means of a third beveled section. The fastening edges 23 are provided with shoulders of the edges 23.1, which laterally cover the beveled edges 25, 27. It should also be mentioned that the vertical profiled wall elements 11 of the vertical frames 10 rest with a profiled side with a row of fastening receivers against the insides of the fastening edges 23 and are connected with them.

Fig. 1b shows an alternative embodiment of the cover element 20, wherein the edge 25, 27 is folded by 180°. The edge 25, 27 supports a bearing bush 29 with a bearing receiver 28.

As Fig. 8 shows, wall elements 70 close off the two sides of the basic rack 60, wherein they are fastened on the fastening edges 23 of the cover elements 20. The cabinet door 80 is also beveled at least in an L-shape at the

WO 2005/083856
PCT/EP2004/005860

circumference of the door leaf 81, as shown by the circumferential edge 82, 83. This circumferential edge can also be closed by means of a third bevel section 84, at least over large portions of the circumference. Furthermore, the inside of the door leaf 81 can support a fastening frame 90, which is spaced apart from the circumferential edge 82, 83 and can also receive a sealing element. The fastening frame 90 supports has receivers and at the same time is used for stiffening the cabinet door 80.

Figs. 9 and 10 show details of the hinging of the cabinet door 80, wherein it should be pointed out that the upper hinge point, not represented, is designed correspondingly in a mirror-reversed manner. The cover element 20 protrudes with the bevel edge 25, 27 from the front of the front vertical frame 10 and also from the edge 23.3 of the fastening edge 23 of the cover element 20. In this case the section 27 of the beveled edge which extends parallel with the base plate 21 can terminate at the edges 23.9 of the fastening edges 22, or can be conducted over a third section as far as the base plate 21. However, the section 27 can reach as far as to the parallel front profiled sides of the vertical profiled wall elements 11 of the front vertical frame 10. Bearing receivers 28 have been cut into the two end areas of the beveled edge 25, 27, into which bearing bushes 29 can be additionally inserted.

The corner area of the hinge side of the cabinet door receives a hinge element 87 with adjustable hinge pins 86, as represented by Fig. 9. If in the hinge element 87 of the lower hinge point the hinge pin 86 has been set to point up in the position shown, it does not protrude from the section 82 of the circumferential edge 82, 83. Therefore the cabinet

WO 2005/083856
PCT/EP2004/005860

door can be placed on the beveled edge 25, 27 of the lower cover element 20 in such a way that the drawn back engagement end of the hinge pin 86 is flush with the bearing receiver 28 or the bearing bush 29. The same applies correspondingly to the upper hinge point. The hinge pins 86 are axially displaced and their engagement ends are introduced into the bearing receivers 28 or bearing bushes 29 of the beveled edges 25, 27 of the cover elements 20. In this case the engaged positions, as well as the disengaged positions, or the hinge pins 86 in the hinge elements 87 can be fixed in place or can be released again.

Locking bars, which can be moved manually or by means of a rod closing device, can be arranged in the area of the circumferential frame 82, 82 on the back of the cabinet door on the lock side of the cabinet door 80, and can be inserted into the unoccupied bearing receptacles 28 or bearing bushes 29 of the beveled edges 25, 27 of the cover elements 20 and can be removed again. In this way the cabinet door 80 can be fixed in place in the locked position, and can be released again from this locked position into the opening position.

In connection with the exemplary embodiment it is again necessary to point out that the cover elements 20 are symmetrically designed in their center plane, which extends parallel in respect to the fastening edges 23. This also applies to the center plane which extends perpendicularly in relation to them, so that they can be used as bottom element and as top element for the basic rack 60. Therefore the corresponding embodiment at the upper and lower hinge points applies to the hinged installation of the cabinet door 80. Regarding the attachment of the locking elements to the cabinet door 80, matters are also the same at the lower and

WO 2005/083856
PCT/EP2004/005860

upper cover element 20 and the lower and upper locking position.

WO 2005/083856
PCT/EP2004/005860

Claims

1. A kit for producing frame structures for switchgear cabinets, consisting of

a) a cabinet rack (30) made of four horizontal broad struts (31), four horizontal depth struts (32), as well as four vertical frame legs (33) of a preset width, depth and height,

b) vertical frames (10) made of two horizontal broad frame struts (12) and two vertical profiled frame elements (11), which can be installed in a cabinet rack (30) and connected with its depth struts (32), and

c) cover elements (20) which, as bottom element and top element, can be connected with two spaced-apart vertical frames (10) to form an independent basic rack (60), and

d) at least one cabinet door (80), which can be hinged on the cover elements (20) and is beveled on its circumference.

2. The kit in accordance with claim 1, characterized in that

the broad struts (31), the depth struts (32) and the frame legs (33) of the cabinet rack (30) are formed as sections of respectively identical profiled elements, which are fixedly connected with each other, for example welded together, in the corner areas of the cabinet rack (30) by means of corner connectors (40).

3. The kit in accordance with claim 1, characterized in that

WO 2005/083856
PCT/EP2004/005860

the broad struts (31) and the depth struts (32) of the cabinet rack (30) form a solid bottom frame and a solid cover frame (35) and

the vertical frame legs (33) are attached in the corner areas of the bottom frame (35) and the top frame (35) and form, together with the corner connectors (40) and the bottom and top frames (35), a continuous exterior receiver (36).

4. The kit in accordance with one of claims 1 to 3, characterized in that

the vertical profiled frame elements (11) of the vertical frames (11) have a profiled base side (11.3) with at least one row of fastening receivers (11.4), which terminate with the front faces of the horizontal broad vertical struts (12), and

lateral legs (11.1 and 11.6) are beveled off on both sides of the profiled base side (11.3), which are oriented to the longitudinal sides of the associated horizontal broad frame struts (12) of the vertical frames (10) and are connected with them.

5. The kit in accordance with claim 4, characterized in that

at least one row of identical fastening receivers is cut in a uniform aligned graduation into the profiled base side (11.3) and the beveled lateral legs (11.1 and 11.6) of the vertical profiled frame elements (11) of the vertical frames (10).

6. The kit in accordance with claim 4, characterized in that

WO 2005/083856
PCT/EP2004/005860

at least one row of equal or identical fastening receivers (11.4, 11.2, 11.7) is cut in the same or different graduation into respectively the profiled base side (11.3) and in the beveled lateral legs (11.3 and 11.6) of the vertical profiled frame elements (11) of the vertical frames (10).

7. The kit in accordance with one of claims 1 to 6, characterized in that

the horizontal broad frame struts (12) and the vertical profiled frame elements (11) of the vertical frames (10) are fixedly connected with each other in the corner areas, for example welded together.

8. The kit in accordance with claim 1, characterized in that

on two facing sides the plate-shaped cover elements (20) have fastening edges (23), which are beveled at right angles and have at least one row of fastening receivers (23.1, 23.2), and

the vertical profiled frame elements (11) of two vertical frames (10) can be connected by means of their profiled base sides (11.3) with the insides of the fastening edges (23) of the cover elements (20) at different spacings to form a basic rack (60).

9. The kit in accordance with one of claims 1 to 8, characterized in that

the horizontal broad frame struts (12) of the vertical frames (10) are provided with cable guide openings (12.2), and

WO 2005/083856
PCT/EP2004/005860

the two vertical frames (10) can be connected via fastening receivers (12.3) of the horizontal broad frame struts (12) with the facing tops of the horizontal depth struts (32) of the cabinet rack (30) at different distances from each other.

10. The kit in accordance with claim 9,
characterized in that

the base plates (21) of the cover elements (20) are provided with cable introduction recesses (21.2) in the basic rack (60) above the horizontal broad frame struts (12) of the vertical frames (10).

11. The kit in accordance with claims 9 and 10,
characterized in that

the fastening edges (23) of the cover elements (20) have connecting strips (26) beveled toward the exterior on their free edges, and protrude past the base plate (21) of the cover elements (20) over the fastening edges (23) and together with the connecting strips (26) form receivers for attaching lateral walls on the basic rack (60).

12. The kit in accordance with one of claims 9 to 11,
characterized in that

the base plates (21) of the cover elements (20) protrude at the sides extending perpendicularly in respect to the fastening edges (23) and have bevels (25), on which a cabinet door can be hinged and locked, and a rear wall can be fastened.

13. The kit in accordance with one of claims 9 to 12,

WO 2005/083856
PCT/EP2004/005860

characterized in that
the base plates (21) of the cover elements (20) are provided with a center opening (21.2) and with fastening bores (22) in the corner areas.

14. The kit in accordance with one of claims 1 to 13, characterized in that
the cabinet rack (30) is formed of an identical bottom frame (35) and an identical top frame (35), which face each other with protruding corner connectors (40) and are connected with each other via the four vertical frame legs (33) to form the cabinet rack (30).

15. The kit in accordance with claim 14, characterized in that
the vertical frame legs (33) of the cabinet rack (30) have a profiled element with a plug-in connection (33.3) for the plug-in element (40.2) of the corner connectors (40), wherein, together with the exterior contour, the profiled element constitutes the exterior receptacle (36), which is designed to be symmetrical in respect to the diagonal plane of the bottom and top frames (35).

16. The kit in accordance with claim 14 or 15, characterized in that
the bottom and the top frames (35) of the cabinet rack (30) have corner receivers (35.1), into which the corner connectors (40) can be placed with a filler element (40.1) and connected with the bottom or top frame (35) wherein, with their exterior contour, the filler elements (40.1) of the corner connectors (40) extend the exterior receptacles (36)

WO 2005/083856
PCT/EP2004/005860

of the vertical profiled frame element (33) of the cabinet rack (30) past the bottom and the top frame (35).

17. The kit in accordance with one of claims 14 to 16, characterized in that

the front sides (33.1, 33.2) of the vertical profiled frame elements (33) of the cabinet rack (30) are connected in an upright manner with the facing sides of the bottom and of the top frames (35) and the filler elements (40.1) of the corner connectors (40).

18. The kit in accordance with one of claims 14 to 17, characterized in that

the vertical profiled frame elements (33) of the cabinet rack (30) form a channel (33.0), open to the interior of the cabinet rack (30), between the bottom and the top frames (35), which can be closed by means of a profiled box (50), and

this profiled box (50) has vertical channels (50.1, 50.2) and is provided with rows of bores (50.4) in the cover wall (50.3).

19. The kit in accordance with claim 18, characterized in that

the cover wall (50.3) of the profiled box (50) covers the channel (33.0) in the vertical profiled frame elements (33) of the cabinet rack (30) with covering strips (50.5).

20. The kit in accordance with one of claims 17 to 19, characterized in that

the profiled side (33.4) of the vertical profiled frame

WO 2005/083856
PCT/EP2004/005860

section (33) forming the channel (33.0) supports connecting strips (33.5) formed on the exterior of the free profiled side (33.6).

21. The kit in accordance with one of claims 1 to 20, characterized in that

the cabinet door (80) is provided with a beveled edge (82, 83), which receives hinge elements (87) with hinge bolts (86), which can be inserted into bearing receivers (28) of the cover elements (20) of the basic rack (60), in the corner areas of the hinge side of the cabinet door (80), and

the hinge bolts (86) are adjustable in an axially limited manner in the hinge elements (87) and can be fixed on the bevel (25) of the cover elements (20) so they do not shift, at least in the position in which they are engaged with the facing bearing receiver (28) or bearing bushing (29).

22. The switchgear cabinet in accordance with one of claims 1 to 21,

characterized in that

the end edges (23.3) of the fastening edges (23) of the cover elements (20) are set back in relation to the bevel (25) at a minimum by an amount which at least corresponds to the dimensions of the first door bevel (82) directed perpendicularly to the door leaf (1).

23. The switchgear cabinet in accordance with one of claims 1 to 22,

characterized in that

bearing bushes (29) are inserted into the bearing

WO 2005/083856
PCT/EP2004/005860

receivers (28) in the bevels (25) of the cover elements (20).

24. The switchgear cabinet in accordance with one of claims 1 to 23,

characterized in that

the lock side of the cabinet door (80) has displaceable locking bars, which can be shifted manually or by means of a rod closing device and can be inserted into the bearing receivers (28) or bearing bushes (29) of the bevels (25) of the cover elements (20) of the basic rack (60), or can be moved out of them.

PCT/EP2004/005860

New specification

(replaces pages 1 and 2 of the original specification)

Kit for Producing Frame Structures for Switchgear Cabinets

The invention relates to a kit for producing frame structures for switchgear cabinets.

Racks for switchgear cabinets are known in various structural sizes in regard to width, depth and height. Twelve racks (sections of a profiled continuous strand) can be connected with each other in the four corner areas of the rack by means of corner connectors, to form a fixed or releasable frame structure.

As EP 0 076 819 A shows, four vertical profiled frame elements can be connected with each other to form a frame structure by means of a cover as bottom unit and a cover as top unit. In this case the frame structure with the fastening receivers of the vertical profiled frame elements makes possible the installation of additional mounting rails.

In connection with the known frame structures the installation requirements very definitely determine the design of the frame legs used.

It is the object of the invention to produce a kit for placement in frame structures for switchgear cabinets, which comprises a few simple components and yet can be matched to the most varied installation requirements.

To attain this object a kit is created, which consists of

- a) a cabinet rack made of four horizontal broad struts,

four horizontal depth struts, as well as four vertical frame legs of a preset width, depth and height,

b) plate-shaped cover elements, which have on two opposite sides fastening edges beveled at right angles with at least one row of fastening receivers,

c) vertical frames made of two vertical profiled frame elements and two horizontal broad frame struts, which can be installed in the cabinet rack, wherein they can be connected with the depth struts, or can be attached at different spacings by means of base profiled sides of the vertical profiled frame elements to the insides of the fastening edges of the cover elements and, with cover elements used as bottom element and top element, form an independent basic rack,

d) at least one cabinet door, which is beveled on its circumference and can be hinged to the cover elements (20).

The cabinet rack alone can be used in a known manner for the installation of different built-in devices, and can be closed off by means of a cabinet door and panel